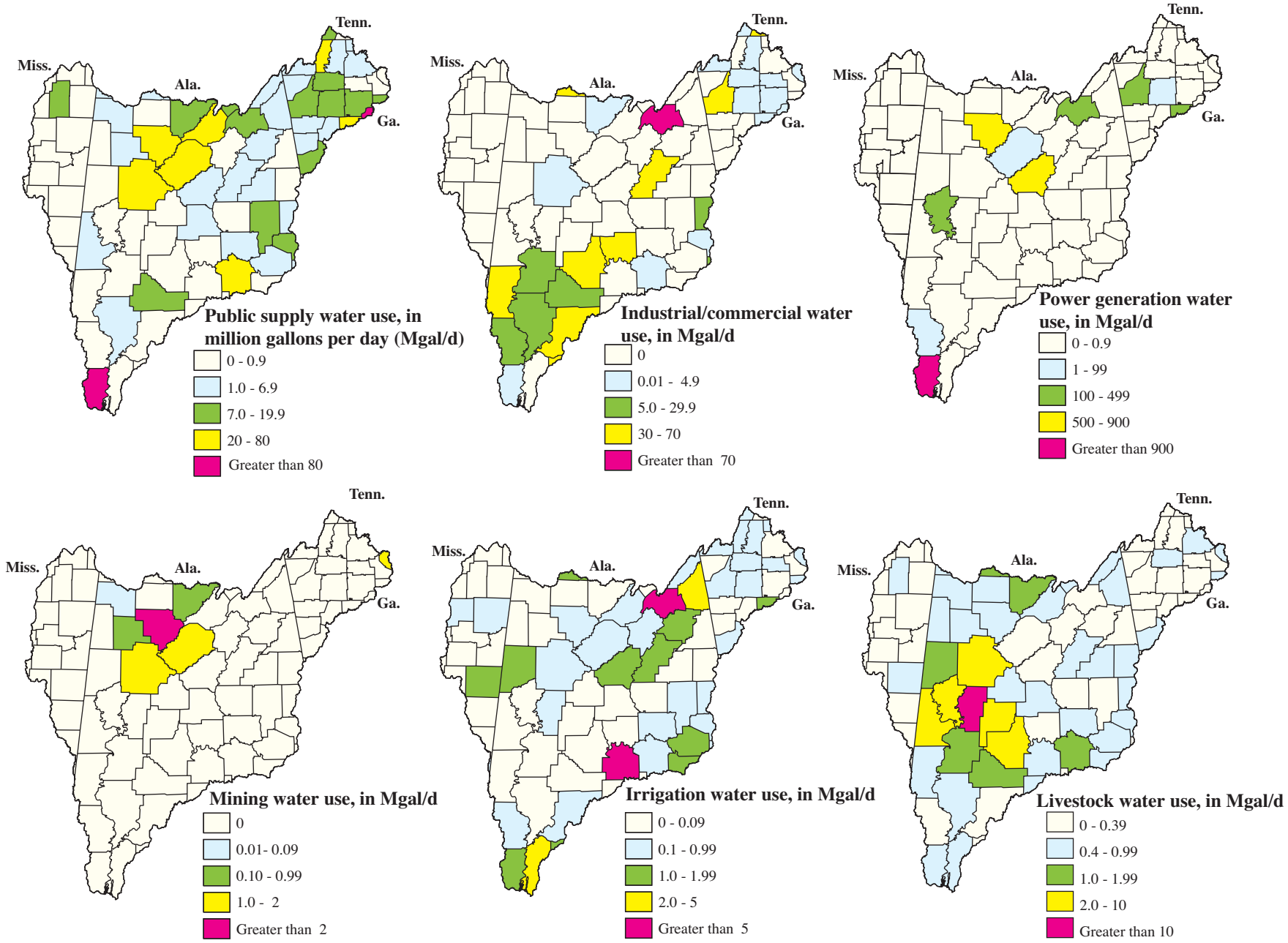


Figure 23. Surface-water use in million gallons per day (Mgal/d) by county area in the Mobile River Basin, 1995.

In the Coastal Plain Physiographic Province (Fall Line Hills, Black Prairie Belt, Southern Hills, Alluvial aquifer, and Deltaic deposits), surface-water use is low in Mississippi, but high in Alabama and usually is related to industrial use (fig. 23). Generally, surface-water use is greatest in the Valley and Ridge, Cumberland Plateau, Southern Hills, and Piedmont because of power generation, public water supply, and industrial and commercial withdrawals (fig. 24). Water use for these four areas is related to the presence of urban areas and the resulting population distribution.

Basinwide, ground-water use is less than surface-water use for all categories with the exception of domestic water supply, which consists of rural wells and springs (table 5) (Price and Clawges, 1999). Public drinking-water supply constitutes 60 percent of all ground-water withdrawals. Ground water is the main public water-supply source for the Fall Line Hills district, Black Prairie Belt district, and the Alluvial aquifer in the Coastal Plain Physiographic Province (fig. 24). In the other physiographic provinces, surface water is the main source of public water supply. Domestic and public water-supply use (fig. 25) corresponds to areas with the largest population densities. Industrial and commercial ground-water use is greatest in the Fall Line Hills and Black Prairie Belt districts of the Coastal Plain Physiographic Province in Mississippi, the Southern Hills district of the Coastal Plain Physiographic Province in Alabama, and the Valley and Ridge Physiographic Province in Georgia. Agricultural water use for livestock is greatest in the Fall Line Hills, Black Prairie Belt, and Southern Hills districts, and the Alluvial aquifer of the Coastal Plain Physiographic Province and Cumberland Plateau Physiographic Province. Ground-water use for irrigation is greatest in the Southern Hills district and the Deltaic deposits of the Coastal Plain Physiographic Province. Ground-water use for mining has a greater spatial distribution than does surface-water use for mining.

WATER-QUALITY ISSUES

Water quality in the Mobile River Basin is highly variable and influenced by many natural and human factors. One valuable source of information about water quality in basins in each State is the State 305(b) report to Congress, which is prepared every 2 years. Another source of information is the Toxics Release Inventory (TRI), published by the U.S. EPA, which provides insight into the potential sources of contaminants present in the Mobile River Basin.

State 305(b) Reports

Impairment of the water quality in stream and ground-water systems can cause the water to be designated as partially supporting or nonsupporting their intended use. Impairment can be caused by both point and nonpoint sources of contamination, such as runoff from urban, agricultural, or forested land, flow regulation, and industrial point sources. In 1994 and 1995, over 9,460 river miles within the Mobile River Basin were assessed. These assessments were made available in the 305(b) water-quality reports to Congress by the Alabama Department of Environmental Management (1996), the Georgia Department of Natural Resources—Environmental Protection Division (1996), and the Mississippi Department of Environmental Quality (1996).

Based on the 1996 State 305(b) water-quality reports, approximately 74 percent of the assessed river and stream miles within the Mobile River Basin were considered to be fully supporting of their classified uses; 15 percent, partially supporting; and 11 percent, nonsupporting. Nonsupporting and partially-supporting stream miles are placed on the State 303(d) list. Several factors were identified as the source for the impairment of the partially and nonsupporting river miles. In 1996, organic enrichment and dissolved oxygen depletion, elevated nutrient concentrations, and siltation were cited most frequently as the sources of impairment for the greatest number of river miles (fig. 26). Bacteria, acidic pH, and elevated metal concentrations also contributed a large percentage to the impairment.

The percentage of river miles that support the designated use classification, and the causes and sources of impairment of the rivers varied among subbasins. Only 64 percent and 67 percent of the river miles assessed in the Cahaba River Basin and Coosa River Basin, respectively, were considered fully supporting of their intended use (fig. 27). The cause of impairment for the Cahaba River Basin was similar to the Mobile River Basin in general; organic enrichment, low dissolved oxygen, elevated nutrient concentrations, and siltation were cited as primary causes of impairment. The sources for the impairment in the Cahaba River Basin were attributed primarily to urban sources, including construction, storm sewers, and

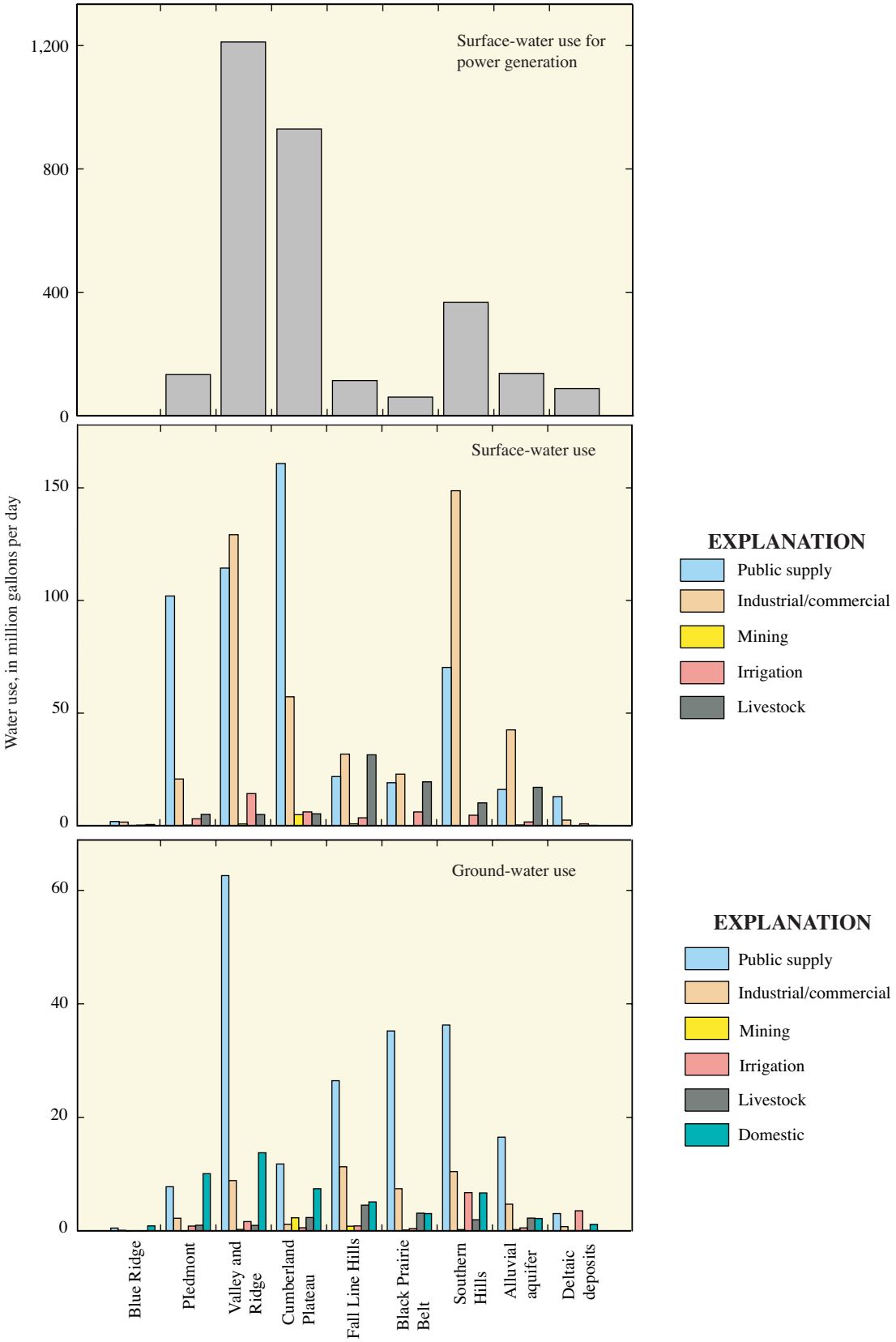
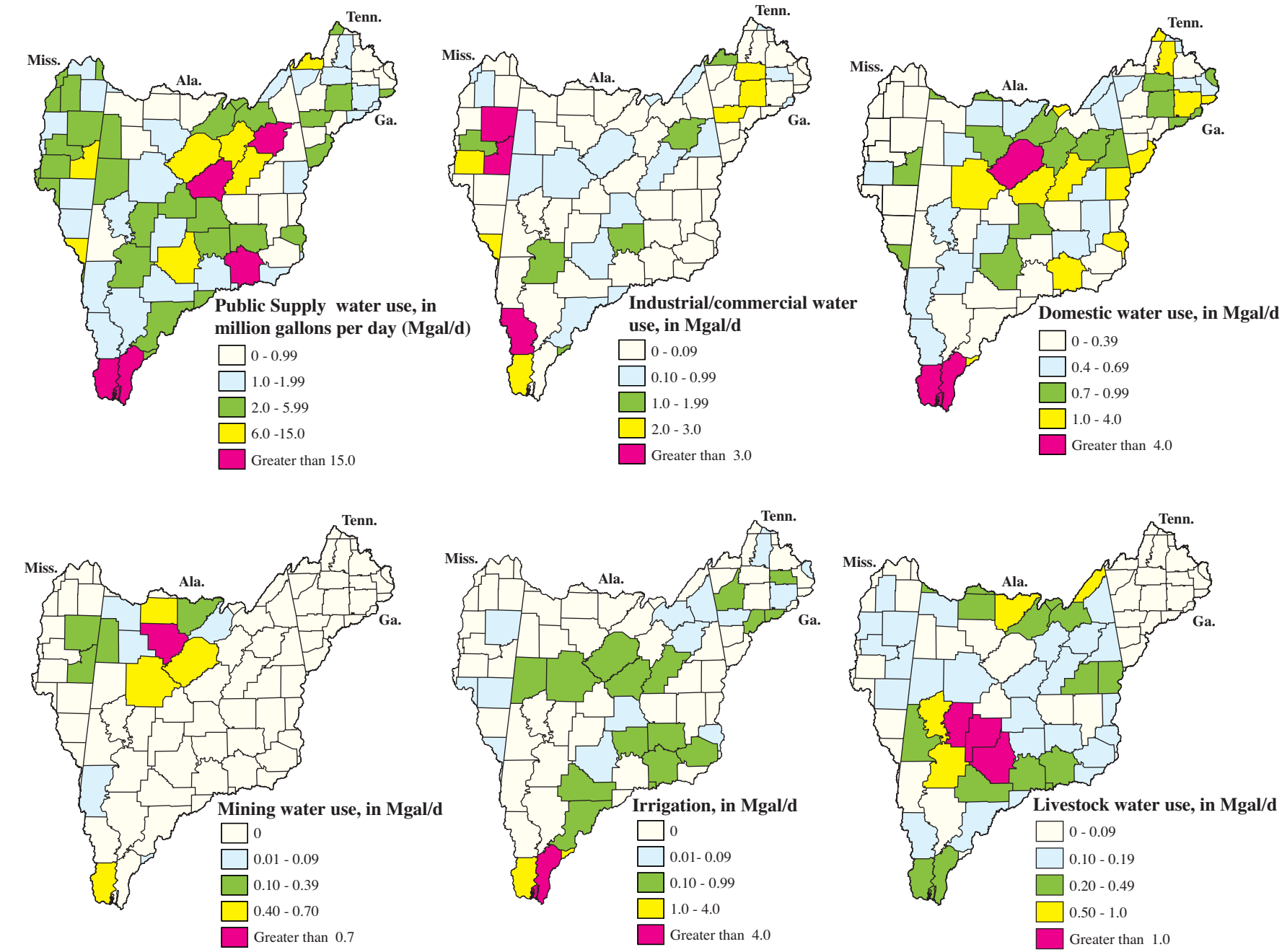


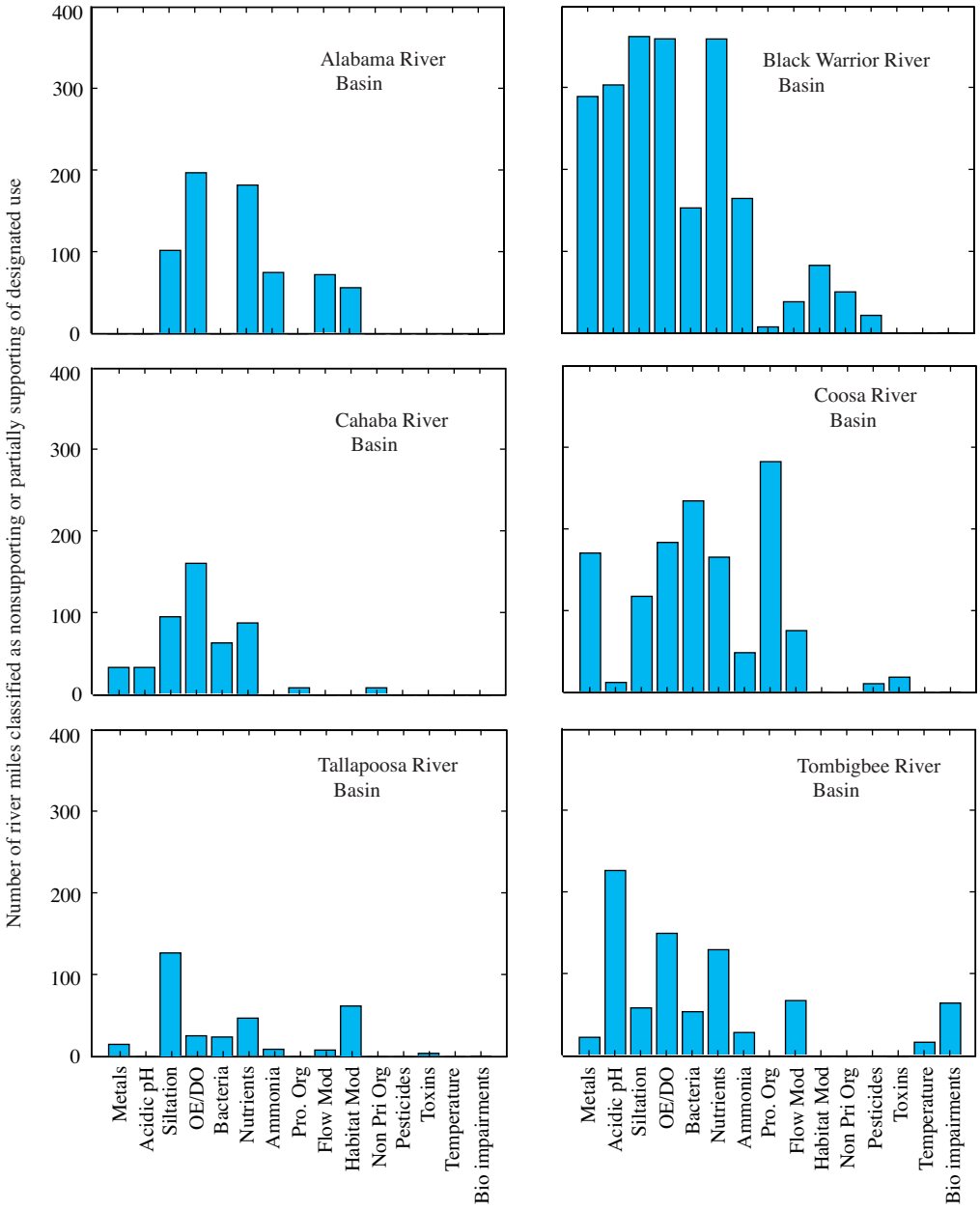
Figure 24. Water use by strata in the Mobile River Basin, 1995.



Base map from U.S. Geological Survey
1:2,000,000 digital data

Modified from Price and Clawges, 1999

Figure 25. Ground-water use in million gallons per day (Mgal/d) by county area for the Mobile River Basin, 1995.



EXPLANATION

OE/DO	Organic enrichment/dissolved oxygen depletion
Pro. Org	Priority organics (mostly polychlorinated biphenyls)
Flow Mod	Flow modification
Habitat Mod	Habitat modification
Non Pri Org	Non-priority organics
Bio impair-ments	Biological impairments

Figure 26. Causes for segments of rivers in the Mobile River Basin to be placed on the 1996 State 303(d) lists.

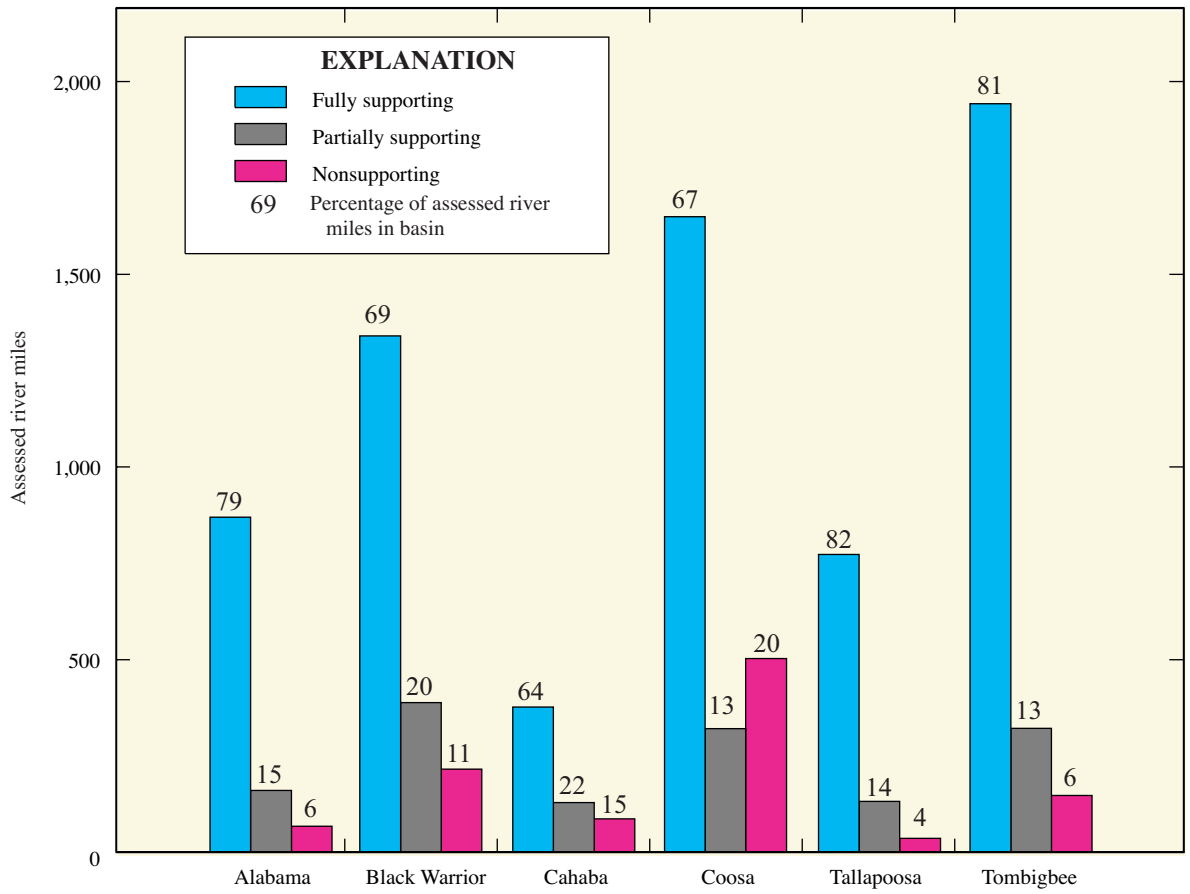
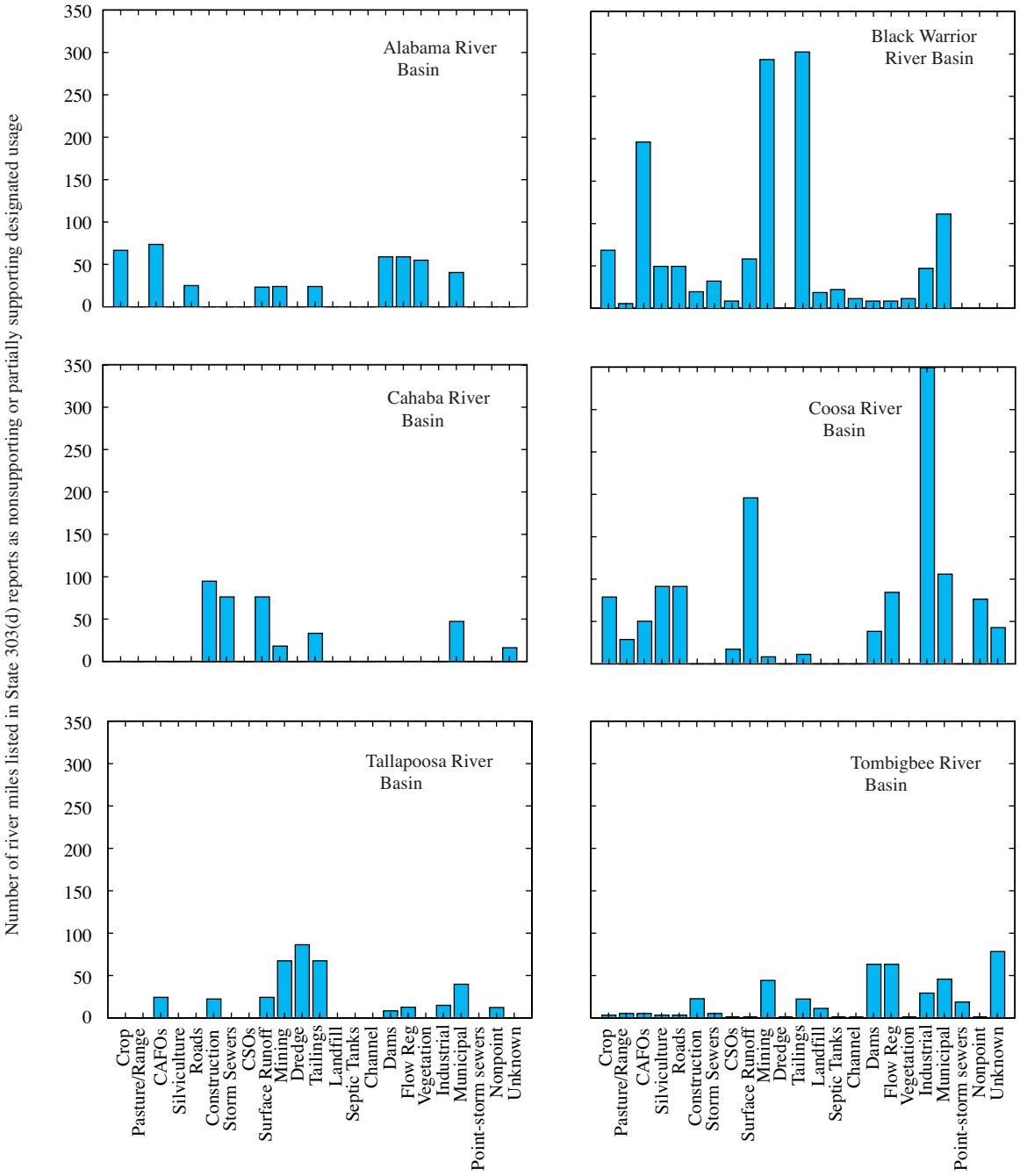


Figure 27. Classification of assessed river miles for supporting intended use in the Mobile River Basin from the 1996 State 305(b) reports.

surface runoff (fig. 28). Priority organics [mainly polychlorinated biphenyls (PCBs)] and pathogens were considered the primary causes of impairment in the Coosa River Basin and were attributed to industrial sources. In the Black Warrior River Basin, 69 percent of the assessed river miles were classified as fully supporting their intended use. Impairment of the Black Warrior River Basin was attributed more to elevated metals, acidic pH, and siltation associated with the greater surface mining activities in that region than in the other basins (figs. 26 and 28). The three remaining subbasins in the Mobile River Basin had percentages of fully supporting river miles greater than that of the entire Mobile River Basin (74 percent): Tallapoosa River Basin (82 percent), Alabama River Basin (79 percent), Tombigbee River Basin (81 percent). Impairment of surface-water segments in the Tallapoosa River Basin primarily was attributed to siltation and habitat modification resulting from dredging and mining activities. The Alabama River's problems stemmed primarily from siltation, organic enrichment and nutrients resulting from agricultural and municipal activities, and flow modification from dams. The sources of impairment in the Tombigbee River Basin were identified as acidic pH, organic enrichment, reduced dissolved oxygen levels, and nutrients resulting from municipal sources, dams, mining, and other unknown or unlisted sources.

The utilization of the State 305(b) reports to summarize water-quality conditions in the basin has some limitations. Assessments and reporting methodologies vary from state to state, and the extent of the investigations are influenced by available funding levels and other local issues. Areas with known water-quality problems are targeted for investigation, which results in a somewhat biased representation of the prevalence of impaired water bodies. Additionally, classification of the causes of impairment and sources of contamination vary among states. Nevertheless, these reports are the most comprehensive ongoing summarization of water-quality conditions available. These reports incorporate data collected by many



EXPLANATION

CAFOs	Combined animal feedlot operations
CSOs	Combined sewerers overflows
Dredge	Dredging operations
Channel	Channel modifications
Flow Reg	Flow regulation

Figure 28. Sources of contamination causing segments of rivers in the Mobile River Basin to be placed on the 1996 State 303(d) lists.

governmental agencies and provide biennial snapshots of conditions throughout the basin and the Nation.

Toxics Release Inventory

The Toxics Release Inventory (TRI), published by the U.S. EPA, is a valuable source of information regarding toxic chemicals that are being used, manufactured, treated, transported, or released into the environment. The TRI requires the reporting of estimated amounts of toxic chemical releases but does not mandate that facilities monitor these releases. In 1998, releases included a combination of atmospheric releases (81,800,000 pounds), landfill (11,300,000 pounds), and discharges directly into the water (3,030,000 pounds). The TRI provides the first comprehensive overview of toxic chemical contamination from manufacturing facilities in the United States; however, the TRI does not cover toxic chemicals that reach the environment from non-industrial sources, such as dry cleaners or auto service stations. The TRI also does not distinguish between amounts that could have been released continuously over the course of the year or possibly in a single large release. Though the TRI data base is a starting point for assessing possible health effects resulting from industrial chemical use, the user cannot ascertain levels of exposure or risk without combining TRI information with information from other sources. The location and magnitude of toxic chemical releases reported in the TRI for 1998 in the Mobile River Basin are shown in figure 29 (U.S. Environmental Protection Agency, 2001).

SUMMARY

The Mobile River Basin is the sixth largest river system in the United States covering about 44,000 square miles and is the fourth largest in terms of flow, having an average annual discharge of about 62,100 ft^3/s. The basin encompasses parts of Alabama, Georgia, Mississippi, and Tennessee. The Mobile River is formed from the confluence of the Tombigbee and the Alabama River systems. These rivers are regulated by dams and reservoirs that strongly influence the hydrology of the basin.

The physiography and geology were used to stratify the Mobile River Basin into nine subunits that represent areas of relative geologic and physiographic homogeneity. This stratification provides a spatial framework in which natural variability in water quality can be quantified and the effects of human-related factors can be assessed. Five physiographic provinces are included in the Mobile River Basin. The southern part of the basin is located in the East Gulf Coastal Plain section of the Coastal Plain Physiographic Province. The northeastern part of the basin lies within the Cumberland Plateau section of the Appalachian Plateaus Physiographic Province, the Valley and Ridge, the Piedmont, and the Blue Ridge Physiographic Provinces. The study unit can be divided into four broad categories of geologic structure that relate to the physiography. From north to south these are (1) flat-lying Paleozoic sedimentary rocks that underlie the Cumberland Plateau Physiographic Province, (2) Paleozoic rocks folded into a series of anticlines and synclines in the Valley and Ridge Physiographic Province where resistant rocks form ridges and soft rocks underlie valleys, (3) intensely deformed metamorphic rocks of the Piedmont and Blue Ridge Physiographic Provinces that have been intruded by small to large bodies of igneous rocks, and (4) gently dipping, poorly consolidated to unconsolidated sediments of the Coastal Plain Physiographic Province.

The wide range of geologic, topographic, and climatic conditions in the Mobile River Basin produce widely varying soil conditions. These different soil conditions are used to divide the basin into seven geographic land areas (Major Land Resource Areas) characterized by a particular combination or pattern of soils, climate, water resources, land use, and agricultural practices.

The climate in the Mobile River Basin is warm and humid, ranging from temperate to subtropical near the coast. In the summer, precipitation moves inland from the Gulf of Mexico. In the winter, precipitation is attributed to arctic fronts that move south from the midwestern part of the continent. Mean annual precipitation for 1961 through 1990, ranged from 53.4 inches per year in Montgomery, Ala., to 64 inches per year in Mobile, Ala. Mean annual runoff ranged from 18 inches per year in the Montgomery area to 30 inches per year in the Birmingham area and in the Blue Ridge Mountains. The mean annual runoff increases in the southern part of the basin reflecting increased annual precipitation. Runoff in the Birmingham area is influenced partly by increased urbanization and the resulting increase in impermeable areas. The higher runoff in the northeastern corner of the study unit is a result, in part, of high precipitation, increased slopes, and the low permeability of the soil

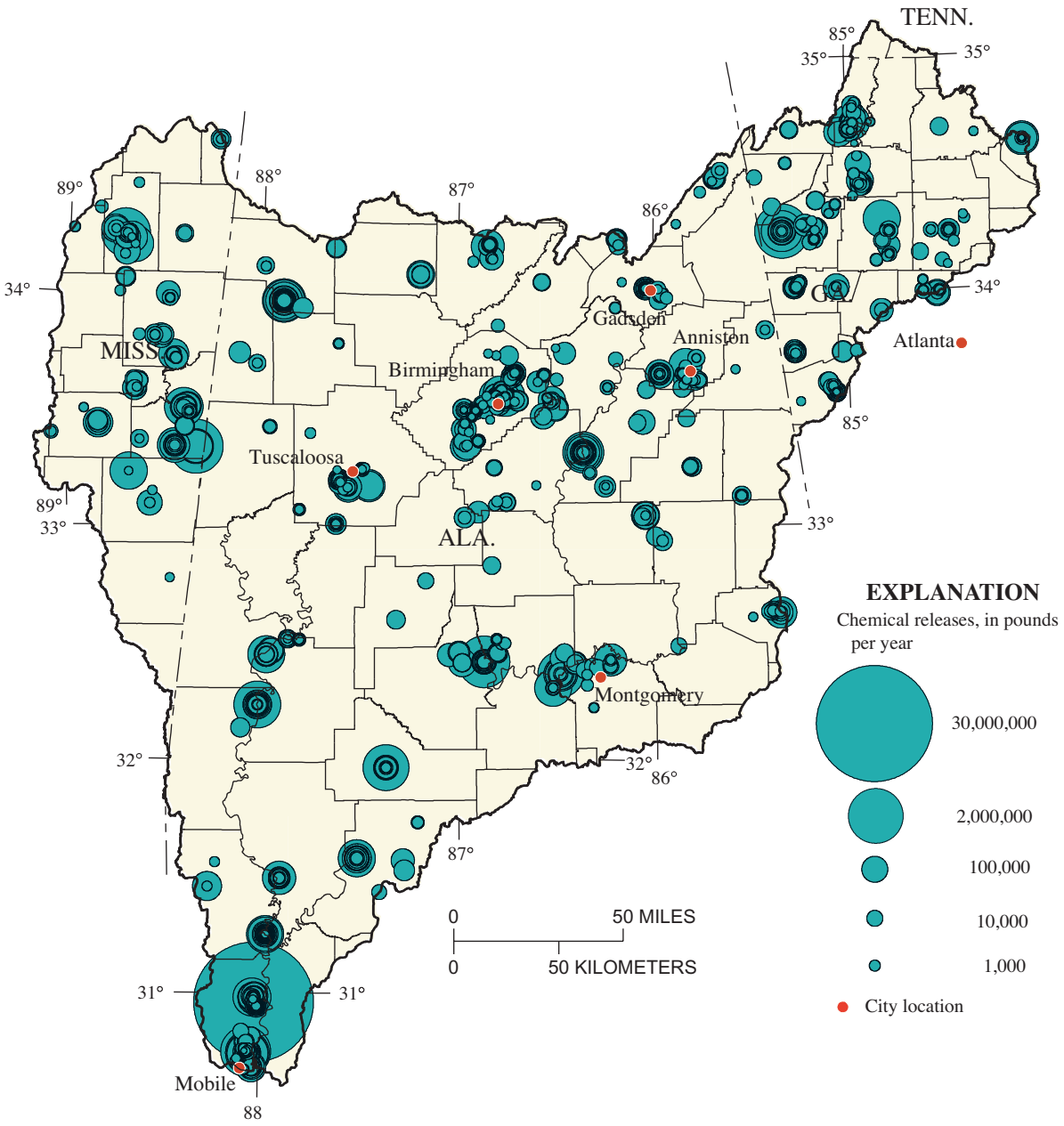


Figure 29. U.S. Environmental Protection Agency Toxic Inventory Release sites in the Mobile River Basin for 1998. (Modified from U.S. Environmental Protection Agency, 2001.)

and rock underlying the Blue Ridge Mountains. For the same time frame (1961 through 1990), the mean annual temperatures ranged from 56 ^{o}F in the northeastern part of the basin to 68 ^{o}F near the coast.

The aquifers in the Mobile River Basin range in composition from unconsolidated sand of the Southeastern Coastal Plain aquifer system to hard crystalline rocks of the Piedmont and Blue Ridge aquifers. These aquifers have been grouped into four major aquifers or aquifer systems on the basis of rock types and groundwater flow systems: Southeastern Coastal Plain aquifer system, Valley and Ridge aquifers, Appalachian Plateaus aquifers, and Piedmont and Blue Ridge aquifers.

Six Level III ecoregions are designated within the Mobile River Basin: (1) Southern Coastal Plain ecoregion, (2) Southeastern Plains ecoregion, (3) Southwestern Plains ecoregion, (4) Ridge and Valley ecoregion, (5) Piedmont ecoregion, and (6) Blue Ridge Mountains ecoregion. The degree of homogeneity among the ecoregions, and the physiography and geology in the Mobile River Basin indicates that the natural variations in the physiography and geology are reflected in the variations of the ecological systems of the basin.

The diverse aquatic habitats in the Mobile River Basin sustain one of the richest aquatic fauna in North America. Endemic fauna include 40 fishes, 33 mussels, 110 aquatic snails, as well as a variety of turtles, aquatic insects, and crustaceans. However, contaminants and modification of aquatic habitat such as impoundments, channelization, dredging, and mining have resulted in the presumed extinction of at least 15 mussels and 38 aquatic snails. The basin is habitat for 39 species of aquatic animals and plants that are currently protected under the Endangered Species Act, including 11 fish, 17 mussels, 7 snails, 2 turtles, and 2 plants.

Land use in the Mobile River Basin is a heterogeneous mixture of forest, agricultural, and urban areas. Most (about 70 percent) of the basin is forested; agriculture, including livestock (poultry, cattle, and swine), aquaculture, row crops (cotton, corn, soybeans, sorghum, and wheat), and pasture land, accounts for about 26 percent of the study unit. The highest concentration of agricultural land use is along the Black Prairie Belt district of the Coastal Plain Physiographic Province. Urban areas account for only 3 percent of the total land use; however, the areal extent of the metropolitan statistical areas may indicate more urban influences.

The total population for the Mobile River Basin was about 3,673,100 people in 1990. The highest population density is within the Valley and Ridge and Cumberland Plateau Physiographic Provinces in Alabama and the Piedmont Physiographic Province in Georgia. The Piedmont Physiographic Province experienced a 60-percent increase in population from 1970 to 1990, as a result of urban sprawl in the Atlanta area. The Blue Ridge Physiographic Province has the lowest overall population density, but had the highest rate of population growth from 1970 to 1990. The Mobile River Basin experienced an overall population growth of 23 percent for the same time period.

Coal extraction has been the primary mining activity in the Mobile River Basin. Coal mining is concentrated in Alabama in the Cumberland Plateau and Valley and Ridge Physiographic Provinces and some adjacent areas in the Fall Line Hills district. Alabama ranks 15th in coal production among coal-producing states. Alabama has four coal fields that are part of the great Appalachian coal basin: Plateau, Warrior, Cahaba, and Coosa fields.

The Mobile River Basin has abundant water resources. Water from streams and aquifers in the Mobile River Basin is used for municipal, industrial and rural water supplies, irrigation, and the generation of energy. Other water uses include hydroelectric-power generation, wastewater assimilation, recreational uses, and fish and wildlife habitat. Hydroelectric power generation uses the greatest amount of surface water where the water is withdrawn for cooling and then discharged back into the water body. Basinwide, surface-water use (excluding hydroelectric-power generation) is about three and a third times greater than ground-water use.

Water quality in the Mobile River Basin is influenced by many natural and human factors. Impairment of water quality can cause water bodies to be designated as partially supporting or nonsupporting of their intended uses. Impairment can be caused by point and nonpoint sources of contamination, such as runoff from urban, agricultural, or forested land, flow regulation, and industrial point sources. The 1996 State 305(b) reports documented the assessment of over 9,460 river miles within the Mobile River Basin by State environmental agencies. Approximately 74 percent of the assessed river and stream miles were considered to be fully supporting of their classified uses;

15 percent, partially supporting; and 11 percent, non-supporting. The U.S. Environmental Protection Agency Toxic Release Inventory serves as a source of information about toxic chemicals released into the environment. A number of Toxic Release Inventory sites are located in the Mobile River Basin and reported total releases of about 93 million pounds in 1998. These toxic chemical releases are self-reported estimates by industry and are a combination of atmospheric, land, and water releases, all of which may potentially affect water quality.

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APPENDIXES

Appendix A. Aquatic species extirpated from or extinct in the Mobile River Basin

[All taxa listed are endemic to the Mobile River Basin. Extinct species have not been reported for 20 or more years. N/A, No recorded common name for these species (Source: U.S. Fish and Wildlife Service, 1998a)]

Common name	Scientific name	Federal status
	FISH	
Lake sturgeon	*Acipenser fulvescens*	Extirpated
	MUSSELS	
Deertoe mussel	*Truncilla truncata*	Extirpated
Coosa elktoe	*Alasmidonta maccordi*	Extinct
Tombigbee moccasinshell	*Medionidus macglameriae*	Extinct
Warrior pigtoe	*Pleurobema rubellum*	Extinct
Highnut	*Pleurobema altum*	Extinct
N/A	*Pleurobema hartmanianum*	Extinct
Longnut	*Pleurobema nucleopsis*	Extinct
True pigtoe	*Pleurobema verum*	Extinct
Yellow pigtoe	*Pleurobema flavidulum*	Extinct
Alabama pigtoe	*Pleurobema johannis*	Extinct
N/A	*Pleurobema aldrichianum*	Extinct
Hazel pigtoe	*Pleurobema avellanum*	Extinct
Alabama clubshell	*Pleurobema troschelianum*	Extinct
Brown Pigtoe	*Pleurobema hagleri*	Extinct
Coosa pigtoe	*Pleurobema murrayense*	Extinct
Warrior pigtoe	*Pleurobema rubellum*	Extinct
	SNAILS	
Umbilicate pebblesnail	*Clappia umbilicata*	Extinct
Cahaba pebblesnail	*Clappia cahabensis*	Extinct
Short-spire elimia	*Elimia brevis*	Extinct
Fusiform elimia	*Elmia fusiformis*	Extinct
High-spired elimia	*Elimia hartmaniana*	Extinct
Constricted elimia	*Elimia impressa*	Extinct
Hearty elimia	*Elimia jonesi*	Extinct
N/A	*Elimia lachryma*	Extinct
Ribbed elimia	*Elimia laeta*	Extinct
N/A	*Elimia macglameriana*	Extinct
Rough-lined elimia	*Elimia pilsbryi*	Extinct
Pupa elimia	*Elimia pupaeformis*	Extinct
Pygmy elimia	*Elimia pygmaea*	Extinct
Cobble elimia	*Elimia vanuxemiana*	Extinct
Closed elimia	*Elimia clausa*	Extinct
N/A	*Elimia gibbera*	Extinct

Appendix A. Aquatic species extirpated from or extinct in the Mobile River Basin—Continued

Common name	Scientific name	Federal status
	SNAILS—Continued	
Excised slitshell	*Gyrotoma excisa*	Extinct
Striate slitshell	*Gyrotoma lewisii*	Extinct
Pagoda slitshell	*Gyrotoma pagoda*	Extinct
Ribbed slitshell	*Gyrotoma pumila*	Extinct
Pyramid slitshell	*Gyrotoma pyramidata*	Extinct
Round slitshell	*Gyrotoma walkeri*	Extinct
Agate rocksnail	*Leptoxis clipeata*	Extinct
Interrupted rochsnail	*Leptoxis foremanii*	Extinct
Maiden rocksnail	*Leptoxis formosa*	Extinct
Rotund rocksnail	*Leptoxis ligata*	Extinct
Lirate rocksnail	*Leptoxis lirata*	Extinct
Black mudalia	*Leptoxis melanoidus*	Extinct
Bigmouth rocksnail	*Leptoxis occultata*	Extinct
Coosa rocksnail	*Leptoxis showalterii*	Extinct
N/A	*Leptoxix torrefacta*	Extinct
Striped rocksnail	*Leptoxis vittata*	Extinct
Oblong rocksnail	*Leptoxis compacta*	Extinct
Shoal sprite	*Amphigyra alabamensis*	Extinct
N/A	*Neoplanorbis carinatus*	Extinct
N/A	*Neoplanorbis smithi*	Extinct
N/A	*Neoplanorbis tantillus*	Extinct
N/A	*Neoplanorbis umbilicatus*	Extinct

Appendix B. Aquatic species in the Mobile River Basin listed under the Endangered Species Act of 1973

[From U.S. Fish and Wildlife Service, 1998b]

Common name	Scientific name	Federal status	General endemic range	Cause
		FISH		
Alabama sturgeon	*Scaphirhynchus suttkusi*	Endangered	Mobile River system, in Alabama and Georgia.	Attributed to over fishing, loss and fragmentation of habitat, and water degradation.
Amber darter	*Percina antesella*	Endangered	Conasauga River, Ga. and Tenn., and Etowah River and Shoal Creek, Ga.	Limited range, proposed reservoir, and water-quality degradation.
Blue shiner	*Cyprinella caerulea*	Threatened	Cahaba River, Ala. and Coosa River and tributaries in Ala., Ga., and Tenn.	Due in part to loss and fragmentation of habitat associated with reservoir construction as well as degradation of water quality.
Cahaba shiner	*Notropis cahabae*	Endangered	Main stem of Cahaba River, Ala. in Bibb, Perry, and Shelby counties.	Adverse habitat alterations and water-quality degradation from residential, industrial, and commercial development.
Cherokee darter	*Etheostoma scotti*	Threatened	Upper Etowah River and two of its tributaries (Long Swamp and Amiclala Creek) in Ga.	Impoundments, degraded water quality, and loss of benthic habitat by siltation.
Conasauga logperch	*Percina jenkinsi*	Endangered	Upper Conasauga River, Tenn. and Ga.	Limited range, proposed reservoir, and water-quality degradation.
Etowah darter	*Etheostoma etowahae*	Endangered	Upper Etowah River and two of its tributaries (Long Swamp and Amiclala Creek) in Ga.	Degraded water quality and loss of benthic habitat by siltation.
Goldline darter	*Percina aurolineata*	Threatened	Cahaba and Coosa River drainages; including the Little Cahaba, Coosawatte, Ellijay, and Cartecay Rivers.	Water-quality degradation and loss of habitat.
Gulf sturgeon	*Acipenser oxyrhynchus desotoi*	Threatened	Historical range extends from Lake Pontchartrain, La. to Tampa Bay, Fla.	Over-exploitation by fishermen, habitat modification, and water-quality degradation. Impoundments may restrict reproduction.
Pygmy sculpin	*Cottus pygmaeus*	Threatened	Coldwater Spring, Calhoun County, Ala.	Water contamination of the subsurface aquifer for Coldwater Spring.
Watercress darter	*Etheostoma nuchale*	Threatened	Four springs in the Black Warrior River watershed, Jefferson County, Ala.	Limited range, increasing urbanization, and potential ground-water contamination.

Appendix B. Aquatic species in the Mobile River Basin listed under the Endangered Species Act of 1973—Continued

Common name	Scientific name	Federal status	General endemic range	Cause
		MUSSELS		
Inflated heelsplitter	*Potamilus inflatus*	Threatened	Tombigbee, Black Warrior, and Coosa Rivers, Ala.	Impacts to habitat from channel modification, impoundments, pollution, and dredging.
Alabama moccasinshell	*Medionidus acutissimus*	Threatened	Mobile River drainage basin, which includes the Alabama, Tombigbee, Black Warrior, Cahaba, and Coosa Rivers and their tributaries.	Habitat modification, sedimentation, eutrophication, and pollution.
Black clubshell	*Pleurobema curtum*	Endangered	Tombigbee River above Pickensville, Ala. and in Miss.	Habitat modification including impoundments and channelization.
Coosa moccasinshell	*Medionidus parvulus*	Endangered	Mobile River drainage basin, which includes the Cahaba River, Sipsey Fork, Black Warrior River, and Coosa River.	Habitat modification, sedimentation, eutrophication, and pollution.
Dark pigtoe	*Pleurobema furvum*	Endangered	Mobile River drainage in parts of Ala., Ga., Miss., and Tenn.	Loss of habitat and water-quality degradation.
Fine-lined pocketbook	*Lampsilis altilis*	Threatened	Mobile River drainage basin, which includes the Alabama, Tombigbee, Black Warrior, Cahaba, Tallapoosa and Coosa Rivers and their and tributaries.	Habitat modification, sedimentation, eutrophication, and pollution.
Flat pigtoe	*Pleurobema marshalli*	Endangered	Tombigbee River between Columbus, Miss. and Epes, Ala.	Habitat modification from navigational impoundments.
Heavy pigtoe	*Pleurobema taitianum*	Endangered	Main stem Tombigbee, Alabama, Cahaba, and Coosa Rivers, Ala. and Miss.	Impoundments, agricultural runoff, sand and gravel mining.
Orangenacre mucket	*Lampsilis perovalis*	Threatened	Alabama River and tributaries; tributaries of the Tombigbee and Black Warrior Rivers; Cahaba River and tributaries.	Habitat modification, sedimentation, eutrophication, and pollution.
Ovate clubshell	*Pleurobema perovatum*	Endangered	Tombigbee River Basin, Ala. and Miss., Black Warrior and Cahaba River Basins, Ala., Alabama River, Ala., Coosa River Basin, Ala., Ga., and Tenn., Chewacla, Uphapee, and Opintlocco Creeks in the Tallapoosa River Basin, Ala.	Habitat modification, sedimentation, eutrophication, and water-quality degradation.

Appendix B. Aquatic species in the Mobile River Basin listed under the Endangered Species Act of 1973—Continued

Common name	Scientific name	Federal status	General endemic range	Cause
		MUSSELS—Continued		
Southern acornshell	*Epioblasma othcaloogensis*	Threatened	Coosa and Cahaba River Basins above the Fall Line, Ala., Ga., and Tenn.	Habitat modification, sedimentation, eutrophication, and water-quality degradation from point and nonpoint sources.
Southern clubshell	*Pleurobema decisum*	Endangered	Entire Mobile River Basin except for the Mobile Delta.	Habitat modification, sedimentation, and water-quality degradation.
Southern combshell	*Epioblasma penita*	Endangered	Alabama, Cahaba, and Coosa Rivers, Ala., Tombigbee River Basin, Miss. and Ala., Black Warrior River below Fall Line, Ala.	Channelization and impoundment, sedimentation, and water-quality degradation. Sand and gravel mining and agricultural runoff.
Southern pigtoe	*Pleurobema georgianum*	Endangered	Mobile River drainange in parts of Ala., Ga., Miss., and Tenn.	Loss of habitat and water-quality degradation.
Stirrupshell	*Quadrula stapes*	Endangered	Tombigbee, Alabama, and Black Warrior Rivers, Ala. and Miss.	Impoundments and nonpoint source pollution.
Triangular kidneyshell	*Ptychobrancus greeni*	Endangered	Mobile River drainange in parts of Ala., Ga., Miss., and Tenn.	Loss of habitat and water-quality degradation.
Upland combshell	*Epioblasma metastriata*	Endangered	Black Warrior and Cahaba River Basins, Ala., Coosa River Basin, Ala., Ga., and Tenn.	Habitat modification, sedimentation, eutrophication, and water-quality degradation from point and nonpoint sources.
		SNAILS		
Cylindrical lioplax	*Lioplax cyclostomaformis*	Endangered	Black Warrior, Cahaba, Alabama, and Coosa Rivers and their tributaries in central Ala.	Impoundments and water-quality degradation.
Flat pebblesnail	*Lepyrium showalteri*	Endangered	Black Warrior, Cahaba, Alabama, and Coosa Rivers and their tributaries in central Ala.	Impoundments and water-quality degradation.
Lacy elimia	*Elimia crenatella*	Threatened	Black Warrior, Cahaba, Alabama, and Coosa Rivers and their tributaries in central Ala.	Impoundments and water-quality degradation.
Painted rocksnail	*Leptoxis taeniata*	Threatened	Black Warrior, Cahaba, Alabama, and Coosa Rivers and their tributaries in central Ala.	Impoundments and water-quality degradation.

Appendix B. Aquatic species in the Mobile River Basin listed under the Endangered Species Act of 1973—Continued

Common name	Scientific name	Federal status	General endemic range	Cause
		SNAILS—Continued		
Plicate rocksnail	*Leptoxis plicata*	Endangered	Black Warrior, Cahaba, Alabama, and Coosa Rivers and their tributaries in central Alabama.	Impoundments and water-quality degradation.
Round rocksnail	*Leptoxis ampla*	Threatened	Black Warrior, Cahaba, Alabama, and Coosa Rivers and their tributaries in central Alabama.	Impoundments and water-quality degradation.
Tulotoma snail	*Tulotoma magnifica*	Endangered	Coosa River Basin from St. Clair Co., Ala. to Alabama River, Clarke/Monroe Co., Ala.	Impoundments and point and nonpoint source pollution.
		TURTLES		
Alabama red-belly turtle	*Pseudemys alabamensis*	Endangered	Mobile Delta	Habitat alterations of rivers for navigation and flow modifications.
Flattened musk turtle	*Sternotherus depressus*	Threatened	Locust Fork, Mulberry Fork, and Sipsey Fork of the Black Warrior River, Ala.	Habitat modification, sedimentation, and water-quality degradation.
		PLANTS		
Harperella	*Ptilimnium nodosum*	Endangered	Little River on Lookout Mountain and Town Creek on Sand Mountain, Ga. and Ala.	Flow and stream bank modification, siltation, and pollution.
Kral's water-plantain	*Sagittaria secundifolia*	Threatened	Little River on Lookout Mountain, Town Creek on Sand Mountain, Sipsey Fork of the Black Warrior River, Ga. and Ala.	Stream bank modification, siltation, and pollution.